



## Sustainable Agricultural Mechanization Strategy Formulation: Concept and Principles

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### What does mechanization encompass?

- All levels of production technology (incl. livestock)
  - Simple handtools (human power)
  - Use of animal traction equipment (animal power)
  - Motorised equipment
    - ❖ Stationary engine-powered (e.g. pumps)
    - ❖ Single axle tractors or tractor/trailer combinations
    - ❖ 4-wheel tractors and tracklayers
- Post-production/processing (at farm level)
- Rural transport

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### Mechanization – its Role and Place

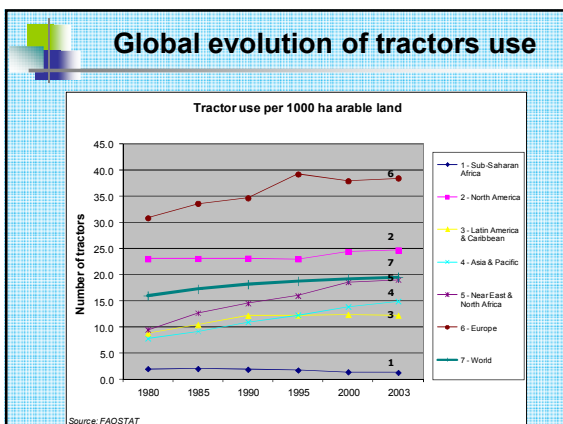
- Input to agriculture
- Means to an end not an end in itself
- It should be demand driven
- Type and degree decided by farmer or user
- If used appropriately, it should facilitate environmental sustainability
- Means to reduce human drudgery

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### The Problem

- How to meet food self sufficiency of an increasing population?
- How can livelihoods be improved, particularly in the rural areas?
- Can the profitability of agricultural production be increased in a sustainable manner?
- How should we promote increased levels of sustainable mechanization?
- How to ensure environmental sustainability?

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### Agricultural intensification in some Asian countries and globally

Countries	Agricultural Land (000ha)	Land irrigated cropland as a percentage of total	Fertilizer (kg/ha)	Mechanization (tractors/1000 ha)
Thailand	19,367	25	92	11.4
Malaysia	7,585	4.8	149.1	5.7
Mongolia	1,800	7.0	2.7	4.2
Myanmar	10,611	18.8	9.0	1.0
Nepal	3,294	34.7	22.7	1.4
Germany	11,997	4	217.4	85.8
Brazil	66,580	4.4	102.9	12.1
Japan	4,762	54.7	282.4	423
World	1,534,466	18.1	90.1	17.5

(Source : FAO, 2001)

### What are the main issues?

- Which type and which level of mechanization should be promoted?
- What should be the role of the Public sector?
- What should be the role of the Private sector?
- How can best be invested in sustainable mechanization development?

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### Stakeholders in SAMS

Private Sector	Public Sector
<b>Mechanization demand</b> <ul style="list-style-type: none"> <li>• Smallholder farmers</li> <li>• Commercial farmers</li> <li>• Farmer organizations</li> <li>• Irrigation groups</li> <li>• Crop processors</li> <li>• Rural transporters</li> </ul>	<b>Mechanization supply</b> <ul style="list-style-type: none"> <li>• Importers</li> <li>• Manufacturers</li> <li>• Blacksmiths</li> <li>• Distributors</li> <li>• Machinery support services</li> </ul>
	<b>Institutional support</b> <ul style="list-style-type: none"> <li>• Government</li> <li>• Policy makers</li> <li>• Associations</li> <li>• Financial services</li> <li>• Extension workers</li> <li>• Researchers</li> <li>• Trainers</li> <li>• NGOs</li> </ul>

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### What is the basic principle?

The diagram shows two boxes. The left box is labeled 'End users ...' and contains an image of a person with a bullock cart. The right box is labeled 'Sub sector: Retailers and Wholesalers, Manufacturers, Importers' and contains an image of a tractor. Two horizontal arrows point between the boxes, one in each direction, indicating a reciprocal relationship.

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### What is the basic principle?

- A manufacturer could make his product more profitable by increasing the price
- But then perhaps the farmer could not afford the product
- Sales would then drop and the manufacturer would still remain unprofitable
- Each of these must be able to develop a PROFITABLE business
- It is clearly a complicated system which merits careful analysis

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### The Agricultural Mechanization System

The flowchart shows a central box 'Sustainable Agricultural production system' with arrows pointing to it from 'Raw materials', 'Local manufacturers Distributors Retailers', and 'Domestic demand & exports'. Arrows also point from 'Local manufacturers...' to 'Raw materials' and from 'Domestic demand & exports' to 'Local manufacturers...'. Above the central box is 'International environment' with arrows pointing down to it. Below the central box is 'Government policies and Institutional support' with arrows pointing up to it.

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### The Role of the Government

**Policy**

- Exchange rate policies
- Policies influencing relative agricultural input prices
- Policies influencing agricultural product prices
- Policies influencing farm and non-farm employment
- Land ownership and tenure policies
- Agrarian institutions
- Farm power research policy
- Infrastructure policy
- Agricultural financial markets
- Industry policy
- Transport policy and motive power

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### Institutional Aspects

- Research and Development in mechanization
- Testing and quality assurance
- Education and training in mechanization sector
- Extension services (private/public)
- Mechanization Departments in the MOA
- Consumer protection

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### What is the aim of a SAMS?

- The creation of effective linkages between each group of stakeholders
- Addressing the issues which affect the profitability of these groups
- Identification of the basic conditions that national governments could provide for a largely self-sustaining development of agricultural mechanization

*Such actions should normally be planned within a policy of minimum or at least very carefully placed direct interventions*

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### Approach for formulating an SAMS

- Agricultural mechanization is a very complex process
- Its development depends on many country-specific factors
- It involves a wide range of stakeholders

If the SAMS is to be "**owned**" then all stakeholders must be involved in its formulation

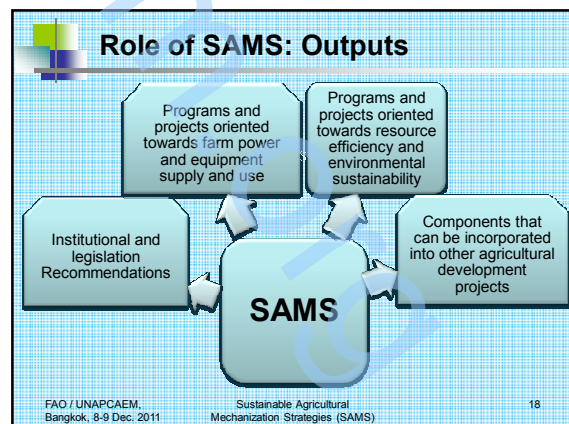
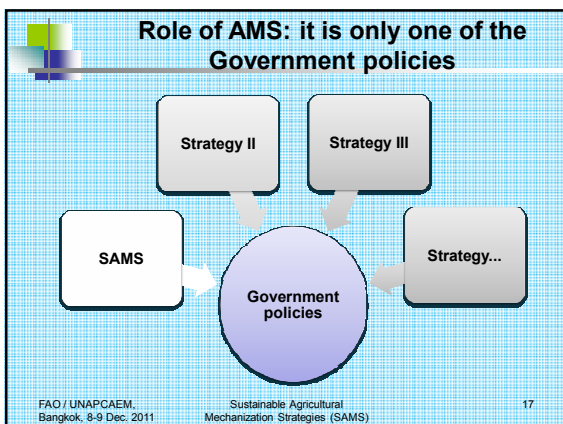
A **PARTICIPATORY** and **HOLISTIC** approach is recommended

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### Two aspects for analysis

- The **DEMAND** side
  - o *The farmers of course, but also*
  - o Production systems and methods?
  - o Resource ownership?
  - o Gender aspects
- The **SUPPLY** side (or Offer)
  - o *The suppliers of course, but also*
  - o National policies for tax, trade ...
  - o Availability of raw materials...

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### Pre-conditions to start to formulate an SAMS?

- Is there an expressed political will?
- Is it recognised that there are bottlenecks for developing the agricultural sector?
- Is the timing right for the exercise?
- Is there awareness of the role and place of sustainable agricultural mechanization?

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### Preparation for SAMS formulation

- Under which government institution should the exercise be based? (Is there a sector-planning unit within the MOA?)
- Have sufficient funds been allocated?
  - The formulation could be locally funded or supported with technical assistance from FAO/UN
  - FAO has supported such exercises in many countries through Tech. Coop. Projects (TCP)

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### Who should lead the formulation?

- Identify a National team
- Identify a National Coordinator
- Appoint a Steering Committee to guide and oversee activities (normally also include members from the private sector)
- External technical assistance

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### How to Formulate a Strategy?

- **Analyse** the existing national farm mechanization situation
- **Define** the actions to move from the existing situation to the optimum future situation
- Organise **Implementation and follow-up**

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### The Formulation process

A typical time frame for the complete process is from 12 to 18 months

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### Thank you

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### Ensuring good participation

- Interview a wide range of stakeholders
- Organise participatory Workshops and discussion groups

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### When are Workshops useful?

- At **Inception** to explain and discuss the Methodology
- During the **Diagnostic** process – often several are arranged, some on specific topics
- During the **Formulation** of the Strategy and Action Plan. Again some specific subjects might receive special focus or Workshops such as for Gender, Conservation Agriculture, ....
- For **Presentation of the proposals** to invite clarifications or comments

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